

IN THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1. (Currently Amended) A recording control apparatus for controlling data recording on a recording medium, comprising:

a reference value determining unit determines a reference value of data to be recorded on the recording medium, the reference value being determined by a data rate and a presentation period of the data so that a reading time of the data is longer than a seeking time of non-consecutive data;

area-reserving means for reserving, as reserved areas, predetermined-sized consecutive empty areas having a predetermined size for guaranteeing a real-time playback from among recording areas on the recording medium;

recording control means for controlling recording of data in units of packets in the reserved areas;

area-freeing means for freeing, as empty areas, a remaining part of the reserved areas in which the data in units of packets is not recorded;

additional reserving means for additionally reserving, as the reserved areas, consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means; and

size-determining means for determining whether or not the consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means have a size less than the predetermined size,

wherein recording of data into the reserved area is terminated when the remaining part of the reserved area is less than the size of a packet to be recorded in the reserved area, and greater than zero,

wherein the size of the packet is determined by the reference value and an alignment of the packet with a boundary of an adjacent ECC block of the recording medium, and

wherein, when the consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means have a size less than the predetermined size, said additional reserving means additionally reserves, as the reserved areas, the consecutive empty areas which have the size less than the predetermined size.

2. (Original) A recording control apparatus according to claim 1, further comprising data-existence determining means for determining whether or not data to be recorded on the recording medium exists,

wherein reservation of the predetermined-sized consecutive empty areas by said area-reserving means, and recording of the data in units of packets by said recording control means are repeatedly performed until there is no more data to be recorded on the recording medium.

3. (Original) A recording control apparatus according to claim 2,
wherein,

among continuous empty areas of the recording areas on the recording medium which have a size equal to or larger than the predetermined size, from a continuous empty area having the largest size, a continuous empty area having the earliest position in order of reading or writing of data on the recording medium, and a continuous empty area closest to one recording area having last recorded data, one continuous empty area is reserved as each of the predetermined-sized consecutive empty areas by said area-reserving means.

4. (Original) A recording control apparatus according to claim 1,
further comprising remaining-part determining means for determining whether or not the reserved areas include a remaining part in which the data in units of packets is not recorded,

wherein, when the reserved areas include the remaining part in which the data in units of packets is not recorded, said remaining-part determining means frees the remaining part of the reserved area.

5-6. (Canceled)

7. (Original) A recording control apparatus according to claim 1,
further comprising packetization means for packetizing data into packets each having a size by which alignment is established with physical unit areas on the recording medium,

wherein said recording control means controls recording of the data in units of the packets.

8. (Original) A recording control apparatus according to claim 7, wherein said packetization means comprises:

data-storage means for temporarily storing data;

storage-amount determining means for determining the amount of data stored in said data-storage means; and

data-extracting means in which, when the amount of data stored in said data-storage means reaches a reference value, data having a size by which alignment is established with the physical unit areas on the recording medium and which is closest to the reference size is extracted from said data-storage means and is output as a packet having a size by which alignment is established with the physical unit areas on the recording medium.

9. (Original) A recording control apparatus according to claim 8, wherein said data-extracting means extracts, from said data-storage means, data having the maximum size by which alignment is established with the physical unit areas on the recording medium.

10. (Original) A recording control apparatus according to claim 7, wherein:

said packetization means comprises a plurality of packetization means for packetizing a plurality of data series into packets; and

said recording control apparatus further comprises multiplexing means for multiplexing the packets corresponding to the plurality of data series which are output from the plurality of packetization means.

11. (Original) A recording control apparatus according to claim 10, wherein said plurality of multiplexing means multiplex the packets corresponding to the plurality of data series in ascending order of the presentation times of data items allocated in the packets.

12. (Previously Presented) A recording control apparatus according to claim 10, wherein said plurality of multiplexing means multiplex the packets corresponding to the plurality of data series in ascending order of the presentation times of data items allocated in packets which each have a size equal to a reference value and which are obtained when the plurality of data series are packetized.

13. (Currently Amended) A recording control method for controlling data recording on a recording medium, comprising the steps of:

determining a reference value of data to be recorded on the recording medium, the reference value being determined by a data rate and a presentation period of the data so that a reading time of the data is longer than a seeking time of non-consecutive data,

reserving, as reserved areas, predetermined-sized consecutive empty areas having a predetermined size for guaranteeing a real-time playback from among recording areas on the recording medium;

controlling recording in the reserved areas of data in units of packets, the data being capable of being recorded in the reserved area;

freeing, as empty areas, a remaining part of the reserved areas in which the data in units of packets is not recorded;

additionally reserving, as the reserved areas, consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means;

and

determining whether or not the consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means have a size less than the predetermined size,

wherein recording of data into the reserved area is terminated when the remaining part of the reserved area is less than the size of a packet to be recorded in the reserved area, and greater than zero,

wherein the size of the packet is determined by the reference value and an alignment of the packet with a boundary of an adjacent ECC block of the recording medium, and

wherein, when the consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means have a size less than the predetermined size, said additional reserving means additionally reserves, as the reserved areas, the consecutive empty areas which have the size less than the predetermined size.

14. (Original) A recording control method according to claim 13, further comprising the step of determining whether or not data to be recorded on the recording medium exists,

wherein the reserving step and the recording step are repeatedly executed until there is no more data to be recorded on the recording medium.

15. (Original) A recording control method according to claim 14, wherein, in the reserving step, among continuous empty areas of the recording areas on the recording medium which have a size equal to or larger than the predetermined size, from a continuous empty area having the largest size, a continuous empty area having the earliest position in order of reading or writing of data on the recording medium, and a continuous empty area closest to one recording area having last recorded data, one continuous empty area is reserved as each of the predetermined-sized consecutive empty areas.

16. (Original) A recording control method according to claim 13, further comprising the step of determining whether or not the reserved areas includes a remaining part in which the data in units of packets is not recorded,

wherein, in the freeing step, when the reserved areas include a remaining part in which the data in units of packets is not recorded, the remaining part is freed.

17-18. (Canceled)

19. (Original) A recording control method according to claim 13, further comprising the step of packetizing data into packets which each have a size by which alignment is established with physical unit areas on the recording medium,

wherein, in the recording controlling step, recording of data in units of the packets is controlled.

20. (Original) A recording control method according to claim 19, the packetizing step comprises the steps of:

determining the amount of data stored in a storage means for temporarily storing data; and

extracting, when the amount of data stored reaches a reference value, from the storage means, data having a size by which alignment is established with the physical unit areas on the recording medium and which is closest to the reference size so that the extracted data is

output as a packet having a size by which alignment is established with the physical unit areas on the recording medium.

21. (Original) A recording control method according to claim 20, wherein, in the extracting step, data having the maximum size by which alignment is established with the physical unit areas on the recording medium is extracted from the storage means.

22. (Original) A recording control method according to claim 19, further comprising the steps of:

packetizing a plurality of data series into packets; and
multiplexing the packets corresponding to the plurality of data series.

23. (Original) A recording control method according to claim 22, wherein, in the multiplexing step, the packets corresponding to the plurality of data series are multiplexed in ascending order of the presentation times of data items allocated in the packets.

24. (Previously Presented) A recording control method according to claim 22, wherein, in the multiplexing step, the packets corresponding to the plurality of data series are multiplexed in ascending order of the presentation times of data items allocated in

packets which each have a size equal to a reference value and which are obtained when the plurality of data series are packetized.

25. (Currently Amended) A computer-readable medium having a program recorded thereon, said program for allowing a computer to perform a recording control method for controlling data recording on a recording medium, the recording control method comprising the steps of:

determining a reference value of data to be recorded on the recording medium, the reference value being determined by a data rate and a presentation period of the data so that a reading time of the data is longer than a seeking time of non-consecutive data,

reserving, as reserved areas, predetermined-sized consecutive empty areas having a predetermined size for guaranteeing a real-time playback from among recording areas on the recording medium;

controlling recording in the reserved areas of data in units of packets, the data being capable of being recorded in the reserved area, and greater than zero;

freeing, as empty areas, a remaining part of the reserved areas in which the data in units of packets is not recorded;

additionally reserving, as the reserved areas, consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means;
and

determining whether or not the consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means have a size less than the predetermined size,

wherein recording of data into the reserved area is terminated when the remaining part of the reserved area is less than the size of a packet to be recorded in the reserved area,

wherein the size of the packet is determined by the reference value and an alignment of the packet with a boundary of an adjacent ECC block of the recording medium, and

wherein, when the consecutive empty areas which follow the predetermined-sized consecutive empty areas reserved by said area-reserving means have a size less than the predetermined size, said additional reserving means additionally reserves, as the reserved areas, the consecutive empty areas which have the size less than the predetermined size.